REMARKS

The examiner is thanked for the performance of a thorough search. By this amendment, Claims 1, and 17-19 have been amended. No claims have been cancelled or added. Hence, Claims 1-31 are pending in the application. The amendments to the claims as indicated herein do not add any new matter to this application. Furthermore, amendments made to the claims as indicated herein have been made to exclusively improve readability and clarity of the claims and not for the purpose of overcoming alleged prior art.

Each issue raised in the Office Action mailed July 28, 2008 is addressed hereinafter.

I. ISSUES NOT RELATING TO PRIOR ART

A. CLAIM OBJECTIONS, CLAIM 18

Claim 18 is objected to because it recites the term "when," which the Office Action alleges should be omitted. Claim 18 now recites "a computer-readable volatile or non-volatile medium storing one or more stored sequences of instructions that are accessible to the processor, wherein execution of the one or more stored sequences of instructions by the processor causes the processor to perform . . . ." Thus, Claim 18 as amended does not recite the term "when," and reconsideration is respectfully requested.

B. 35 U.S.C. § 101

Claim 17 is rejected under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. The Office Action alleges that "means for" recited by Claim 17 "appear to be nothing more than computer program modules, thereby invoking 35 U.S.C. 101 as non-statutory subject matter." Claim 17 now recites an apparatus comprising one or more processors, which by definition is a machine or an article of manufacture. Thus, Claim 17 clearly recites patentable subject matter under 35 U.S.C. § 101. Further, Applicant's disclosure states that

implementations can use hardware or firmware and not merely software or printed program listings. Reconsideration is respectfully requested.

II. ISSUES RELATING TO PRIOR ART

Please note that the ordering of the issues in this response is different from the ordering in the Office Action. This reordering is to increase the clarity of the discussion.

A. CLAIMS 1, 2, 11, 15, AND 16

Claims 1, 2, 11, 15, and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,944,663 to Schuba, et al. ("Schuba") in view of U.S. Patent No. 6,321,339 to French, et al. ("French"). The rejection is respectfully traversed.

Schuba and French are not properly combined in this rejection under 35 U.S.C. § 103(a) because of a lack of motivation to combine by a person of ordinary skill in the art. French contains no suggestion that using the method of authentication described therein would be useful as part of a proof-of-work approach to protect against denial of service attacks. The rationale asserted by the Office Action, "providing categories of access based on values associated with authentication outcomes," is unsupported by evidence from the references or any other source. Thus, it would not have been obvious to one of skill in the art to combine methods from French with methods from Schuba.

Claim 1 recites:

A method of preventing an attack on a network, the method comprising the computer-implemented steps of:

receiving a request to access a resource from a user, wherein the request includes an accumulated work value;

wherein the accumulated work value represents a total amount of work previously performed by the user and accumulated across multiple prior requests by the user;

determining whether the accumulated work value exceeds a required work threshold value, and if not, requiring the user to perform a quantity of work as a condition for accessing the resource;

providing the user with access to the resource;

determining an amount of accumulated work output value to provide to the user based on a volume of data communicated between the resource and the user; and
wherein the accumulated work output value represents a second amount of work performed by the user;
providing the accumulated work output value to the user.

At least the above-bolded features of Claim 1 are not made obvious by Schuba or French, even when taken in combination under 35 U.S.C. § 103(a).

The Office Action cites Schuba Col 3 Lines 52-58 for disclosing "receiving a request to access a resource from a user, wherein the request includes an accumulated work value" recited by Claim 1. This is incorrect.

The cited portion of Schuba describes a system that "receives a request for service from a client." In response to the request in Schuba, the system generates a random number and "selects a value for the parameter, n, which specifies the amount of computational work involved in computing the preimage x." In Schuba Col 3 Lines 59-60, the system stores the random number and the parameter, n, at a server and then **sends those values to the client**. The system of Schuba does not teach an accumulated work value as recited by Claim 1, nor does Schuba disclose any such value that is included in the client's request. Thus, Schuba fails to teach or suggest "receiving a request to access a resource from a user, wherein the request **includes an accumulated work value**" recited by Claim 1. It is not even alleged that French teaches this feature of Claim 1.

The Office Action cites French Col 14 Lines 1-14 for teaching "wherein the accumulated work value represents a total amount of work previously performed by the user and accumulated across multiple prior requests by the user," as recited by Claim 1. This is incorrect.

The cited portion of French describes a "transaction record" that is used to "keep track of user input and authentication results." The authentication results in the transaction record "may .

. . be combined with the results of second level authentication . . . to determine an overall authenticity certainty score." French's process of authentication uses queries that are directed from the server to the client. Thus, French fails to teach or suggest "multiple prior requests by the user" as recited by Claim 1.

Furthermore, the "accumulated work value" recited in Claim 1 is included in "a request to access a resource" sent by a user. The transaction record, or any other value described in French, is not included in a user request as recited by Claim 1. Thus, French fails to teach or suggest "wherein the accumulated work value represents a total amount of work previously performed by the user and accumulated across multiple prior requests by the user," as recited by Claim 1, even when taken in combination with Schuba under 35 U.S.C. 103(a).

The Office Action cites Schuba Col 4 Lines 35-39 and Col 3 Lines 50-52 for teaching "determining whether the accumulated work value exceeds a required work threshold value, and if not, requiring the user to perform a quantity of work as a condition for accessing the resource," as recited by Claim 1. This is incorrect.

Col 4 Lines 35-39 of Schuba describes verifying a client's solution of a puzzle. While solving the puzzle in Schuba inherently involves work on the client's part, Schuba does not teach an "accumulated work value" or a "required work threshold value" in any way. Also, determining if "the client successfully solved the client puzzle" as recited by Schuba does not equate to "determining whether the accumulated work value **exceeds** a required work threshold value" as recited by Claim 1. Because Schuba fails to teach "determining whether the **accumulated work value exceeds a required work threshold value**," it is impossible that Schuba teaches or suggests "determining whether the accumulated work value exceeds a required work threshold value, and if not, requiring the user to perform a quantity of work as a

condition for accessing the resource," as recited by Claim 1. It is not even alleged that French discloses this feature of Claim 1.

The Office Action cites Schuba Col 3 Lines 53-58 for teaching "determining an amount of accumulated work output value to provide to the user based on a volume of data communicated between the resource and the user" recited by Claim 1. This is incorrect.

As previously stated, the Col 3 Lines 53-58 of Schuba describes a system that generates a random number and "selects a value for the parameter, n, which specifies the amount of computational work involved in computing the preimage x" in response to a client request. Schuba fails to teach or suggest basing "an amount of accumulated work output value . . . on a **volume of data communicated between the resource and the user**" as recited by Claim 1. More specifically, the values described in the cited portion of Schuba are either a random number, a transaction identifier, or a measure of the amount of computational work that goes into solving a puzzle. Thus, Schuba fails to teach or describe "determining an amount of accumulated work output value to provide to the user based on a volume of data communicated between the resource and the user" recited by Claim 1. It is not even alleged that French discloses this feature of Claim 1.

The Office Action cites French Col 14 Lines 1-14 for teaching "wherein the accumulated work output value represents a second amount of work performed by the user" recited by Claim 1. This is incorrect.

As previously discussed, this portion of French describes a "transaction record" that is used to "keep track of user input and authentication results." The authentication results in the transaction record "may . . . be combined with the results of second level authentication . . . to determine an overall authenticity certainty score." French's mere description of a transaction record that keeps track of user input is not sufficient to teach "a second amount of work

performed by the user" that is "based on a volume of data communicated between the resource and the user" as recited by Claim 1. Thus, French fails to teach or describe "wherein the accumulated work output value represents a second amount of work performed by the user" recited by Claim 1, even when taken in combination with Schuba under 35 U.S.C. 103(a).

The Office Action cites Schuba Col 3 Lines 55-58 for allegedly teaching "providing the accumulated work output value to the user" recited by Claim 1. This is incorrect.

The cited portion of Schuba describes specifying an "amount of computational work involved in computing a preimage." The cited portion of Schuba does not disclose providing a value to a user. Furthermore, as discussed above, Schuba fails to teach an "accumulated work output value" recited by Claim 1. Therefore, it is impossible that Schuba teaches or suggests "providing the accumulated work output value to the user" recited by Claim 1. It is not even alleged that French teaches this feature of Claim 1.

For at least these reasons, Claim 1 is patentable over Schuba and French.

Claim 16 recites:

A method of preventing an attack on a network, the method comprising computer-implemented steps of:

receiving a request to access a resource from a user, wherein the request includes an accumulated work value that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource;

determining whether the accumulated work value exceeds a required work threshold value; and

providing the user with access to the resource only when the accumulated work value exceeds a required work threshold value.

At least the above-bolded features of Claim 16 are not made obvious by Schuba or French, even when considered in combination under 35 U.S.C. § 103(a).

The Office Action cites Schuba Col 3 Lines 52-53 for allegedly teaching "receiving a request to access a resource from a user," and French Col 14 Lines 1-14 for disclosing "wherein

the request includes an accumulated work value that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource," as recited by Claim 16. This is incorrect.

As previously stated, French Col 14 Lines 1-14 describes a "transaction record" that is used to "keep track of user input and authentication results." The authentication results in the transaction record "may . . . be combined with the results of second level authentication . . . to determine an overall authenticity certainty score." However, the results of the second level authentication that may be combined with the original authentication results in French is not an "accumulated work value [that] represents work that the resource has previously required the user to perform **in order to obtain previous access to the resource**" as recited in Claim 1. The dual levels of authentication described in French are the result of a single request by the client. Thus, any work being done to obtain access to a resource in French does not include "work that the resource has previously required the user to perform in order to obtain **previous access** to the resource**."**

Furthermore, the cited portion of Schuba describes a system that "receives a request for service from a client." However, Schuba fails to teach or suggest a request from a client that "**includes an accumulated work value** that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource," as recited by Claim 16. Thus, French and Schuba, taken in combination under 35 U.S.C. § 103(a), fail to teach or suggest "receiving a request to access a resource from a user, wherein the request includes an accumulated work value that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource" recited by Claim 16.

The Office Action cites Schuba Col 4 Lines 35-39 for allegedly teaching "determining whether the accumulated work value exceeds a required work threshold value" recited by Claim 16. This is incorrect.

As previously stated, Col 4 Lines 35-39 of Schuba describes verifying a client's solution of a puzzle. While solving the puzzle in Schuba inherently involves work on the client's part, this portion of Schuba does not teach an "accumulated work value" or a "required work threshold value" in any way. Thus, determining if "the client successfully solved the client puzzle" as recited by Schuba does not equate to "determining whether the accumulated work value **exceeds** a required work threshold value" as recited by Claim 16. It is not even alleged that French discloses this feature of Claim 16.

The Office Action cites Schuba Col 4 Lines 36-39 for allegedly teaching "providing the user with access to the resource only when the accumulated work value exceeds a required work threshold value" recited by Claim16. This is incorrect.

As discussed above, Schuba fails to teach or suggest "determining whether the accumulated work value exceeds a required work threshold value" as recited by Claim 16. Thus, it is impossible that Schuba discloses "providing the user with access to the resource **only when the accumulated work value exceeds a required work threshold value**" as recited by Claim16. Again, it is not alleged that French discloses this feature of Claim 16.

Therefore, for at least the above reasons, Claims 1 and 16 are patentable over Schuba and French, even when taken in combination under 35 U.S.C. § 103(a). Claims 11 and 15 depend from Claim 1 and therefore Claims 11 and 15 include by dependency each of the features described above that distinguish Claim 1 from Schuba and French. Therefore, Claims 11 and 15 are also patentable over Schuba and French. Reconsideration is respectfully requested.

B. CLAIMS 17-19

Claims 17-19 are rejected under 35 U.S.C. § 102 as being anticipated by Schuba. The rejection is respectfully traversed. Claims 17-19 have been amended such that these claims include the same features described above for Claim 1 that distinguishes Claim 1 from Schuba, even when taken in combination with French under 35 U.S.C. § 103(a). Thus, for the same reasons set forth above for Claim 1, Schuba does not anticipate Claims 17-19, even when taken in view of French.

C. CLAIMS 20, 24, AND 28

Claims 20, 24, and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schuba. The rejection is respectfully traversed. Claims 20, 24, and 28 depend from Claims 19, 17, and 18 respectively, and are patentable over Schuba for at least the same reasons as those discussed in connection with Claims 17-19. As is discussed above, Claims 17-19 recite features that Schuba does not disclose. Therefore, Claims 20, 24, and 28, which inherit these features, are not anticipated by Schuba.

D. CLAIMS 3-10, AND 12-14

Claims 3-10, and 12-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schuba in view of French and further in view of U.S. Patent No. 7,197,639 to Juels, et al. ("Juels"). The rejection is respectfully traversed. Claims 3-10, and 12-14 depend from independent Claim 1, discussed above, and are patentable over the cited references for at least the same reasons as those discussed in connection with Claim 1. As is discussed above Claim 1 recites features that Schuba and French do not disclose. The Office Action does not even allege that Juels discloses these features. Therefore, Claims 3-10, and 12-14, which inherit these features, are patentable over Schuba, French, and Juels, even when considered in combination, under 35 U.S.C. § 103(a).

E. CLAIMS 21-23, 25-27, AND 29-31

Claims 21-23, 25-27, and 29-31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schuba in view of Juels. The rejection is respectfully traversed. Claims 21-23, 25-27, and 29-31 depend from independent Claims 17-19, discussed above, and are patentable over the cited references for at least the same reasons as those discussed in connection with these independent claims. As is discussed above, Claims 17-19 recite features that Schuba does not disclose. The Office Action does not even allege that Juels discloses these features. Therefore, Claims 21-23, 25-27, and 29-31, which inherit these features, are patentable over Schuba and Juels, even when considered in combination, under 35 U.S.C. § 103(a).

III. CONCLUSIONS & MISCELLANEOUS

For the reasons set forth above, all of the pending claims are now in condition for allowance. The Examiner is respectfully requested to contact the undersigned by telephone relating to any issue that would advance examination of the present application.

A petition for extension of time, to the extent necessary to make this reply timely filed, is hereby made. If applicable, a law firm check for the petition for extension of time fee is enclosed herewith. If any applicable fee is missing or insufficient, throughout the pendency of this application, the Commissioner is hereby authorized to charge any applicable fees and to credit any overpayments to our Deposit Account No. 50-1302.

Respectfully submitted,
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